

What is claimed is:

(9) CLAIMS

1 1. A method for reproducing a sepia tone image, the method comprising:
2 scanning said sepia tone image with visible light and infrared light;
3 using data associated with infrared light reflected from the image and data
4 associated with visible light reflected from the image, creating adjusted data; and
5 outputting a reproduction image using said adjusted data.

1 2. The method as set forth in claim 1 wherein creating adjusted data further
2 comprises:
3 obtaining tristimulus color space coordinates for pixels of the sepia tone
4 image in a first coordinate system;
5 converting the first coordinate system to a second coordinate system
6 wherein infrared radiation data is used to modify a single coordinate thereof; and
7 factoring data values associated with said second system based on data
8 values associated with said first coordinate system.

1 3. The method as set forth in claim 2 wherein said obtaining tristimulus color
2 space coordinates for pixels of the sepia tone image associated with a first
3 coordinate system comprises:
4 using red, green, blue color space coordinates.

1 4. The method as set forth in claim 3 wherein the second color coordinate
2 system is $L^*a^*b^*$, where L = luminance value, a=red-yellow value, and b=green-
3 blue value.

1 5. The method as set forth in claim 4 wherein said converting further
2 comprises:
3 transforming all RGB space coordinates to $L^*a^*b^*$ space coordinates.

1 6. The method as set forth in claim 5 wherein said converting further
2 comprises:
3 determining a benchmark value of "L" associated with said sepia tone
4 image.

1 7. The method as set forth in claim 6 wherein said converting further
2 comprises:
3 discarding all pixels where 'L' is less than said benchmark value.

1 8. The method as set forth in claim 7 wherein said converting further
2 comprises:
3 discarding all pixels wherein 'b' is negative.

1 9. The method as set forth in claim 8 wherein said converting further
2 comprises:
3 calculating a median value for 'a' and a median value for 'b' wherein a set of

4 said median values represents a background chroma for said sepia tone image.

1 10. The method as set forth in claim 9 wherein said factoring comprises:

2 replacing all 'a' values of said L*a*b* space coordinates with said median 'a'
3 value,

4 replacing all 'b' values of said L*a*b* space coordinates with said median 'b'
5 value,

6 replacing all 'L' values of said L*a*b* space coordinates with an associated
7 data value representative of infrared light reflected from the sepia tone image.

1 11. A sepia tone scanner comprising:

2 illuminating means for scanning a document with visible light and infrared
3 radiation;

4 means for receiving data representative of reflected visible light and data
5 representative of reflected infrared radiation; and

6 means for adjusting said data representative of reflected visible light using
7 said data representative of reflected infrared radiation.

1 12. The apparatus as set forth in claim 11 comprising:

2 if said apparatus is a reduction optic scanner, said illuminating means
3 including means for selectively filtering said infrared radiation from being scanned
4 across said image.

1 13. The apparatus as set forth in claim 11 comprising:

2 if said apparatus is a contact image scanner, said illuminating means
3 including an infrared emitter.

1 14. The apparatus as set forth in claim 11 said means for adjusting comprising:

2 means for converting RGB color coordinate data to L*a*b* color coordinate
3 data,

4 means for determining an image background level L_b value, and

5 means for replacing the L*a*b* color coordinate data with coordinate data
6 representative of original sepia tones of said sepia tone image.

1 15. The apparatus as set forth in claim 14, said means for replacing the L*a*b*
2 color coordinate data with coordinate data representative of original sepia tones of
3 said sepia tone image, further comprising:

4 means for calculating median a-value coordinate and median b-value
5 coordinate,

6 means for replacing a-value color coordinate data with said median a-value
7 coordinate and b color coordinate data with said median b-value coordinate, and

8 means for replacing L coordinates of said L*a*b* color coordinate data with
9 received said data representative of reflected infrared radiation.

1 16. The apparatus as set forth in claim 15 comprising:

2 means for converting coordinate data representative of original sepia tones
3 of said sepia tone image to an output device color coordinate system.

1 17. A computer memory device comprising:

2 computer code for receiving data representative of reflected visible light and
3 data representative of reflected infrared radiation; and
4 computer code for adjusting said data representative of reflected visible light
5 using said data representative of reflected infrared radiation.

1 18. The device as set forth in claim 17, said computer code for adjusting
2 comprising:

3 computer code for converting RGB color coordinate data to L*a*b* color
4 coordinate data,

5 computer code for determining an image background level L_b value, and

6 computer code for replacing the L*a*b* color coordinate data with coordinate
7 data representative of original sepia tones of said sepia tone image.

1 19. The device as set forth in claim 17, said computer code for replacing the
2 L*a*b* color coordinate data with coordinate data representative of original sepia
3 tones of said sepia tone image. further comprising:

4 computer code for calculating median a-value coordinate and median b-
5 value coordinate,

6 means for replacing a-value and b-value color coordinate data with said
7 median a-value and median b-value coordinate, respectively, and

8 means for replacing L coordinates of said L*a*b* color coordinate data with
9 received said data representative of reflected infrared radiation.

1 20. The device as set forth in claim 17 comprising:
2 computer code for converting coordinate data representative of original
3 sepia tones of said sepia tone image to an output device color coordinate system.

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